

APPENDIX B - METHOD DETECTION LIMITS

**Table B1 - Detection Limits for Volatile Organic Compounds in Soils (Mexican Laboratory)
EPA Method 8240**

ANALYTE	PQL (mg/Kg)	MDL (mg/Kg)
Chloromethane	0.24	0.08
Chloroethane	0.24	0.08
Vinyl Chloride	0.054	0.18
Acetone	0.09	0.03
Carbon Bisulfide	0.15	0.05
Methylene Chloride	0.31	0.1
1,1-Dichloroethane	0.405	0.13
Methyl Ethyl Ketone	0.16	0.05
Chloroform	0.092	0.03
1,1,1-Trichloroethane	0.165	0.05
1,2-Dichloroethane	0.165	0.05
Benzene	0.165	0.05
Carbon Tetrachloride	0.091	0.03
1,2-Dichloropropane	0.25	0.08
Trichloroethylene	0.165	0.05
Dichlorobromomethane	0.31	0.09
Methyl Isobutyl Ketone	0.35	0.11
Toluene	0.22	0.07
1,1,2-Trichloroethane	0.22	0.09
Chlorobenzene	0.38	0.12
Ethylbenzene	0.29	0.09
Dibromochloromethane	0.375	0.12
m,p-xylenes	0.51	0.15
Bromoform	0.51	0.15
Styrene	0.51	0.15
O-xylene	0.51	0.15
1,1,2,2-Tetrachloroethane	0.22	0.07
Trichlorofluoromethane	0.51	0.15
Tetrachloroethylene	0.165	0.05
1,2 Dichloroethane	0.31	0.1
Bromodichloromethane	0.25	0.08
1,3-Dichloropropane	0.35	0.11

PQL = PRACTICAL QUANTITATION LIMIT

MDL = MINIMUM DETECTION LIMITS

Table B2 - Detection Limits for Metals in Soil (Mexican Laboratory)
EPA Method 6010

ANALYTE	DETECTION LIMITS (mg/Kg)
Silver (Ag)	4.12
Aluminum (Al)	4.59
Arsenic (As)	22.15
Barium (Ba)	2.80
Cadmium (Cd)	2.92
Chromium (Cr)	3.30
Copper (Cu)	3.23
Iron (Fe)	23.64
Potassium (K)	35.01
Magnesium (Mg)	1.81
Manganese (Mn)	1.37
Nickel (Ni)	5.62
Lead (Pb)	20.19
Selenium (Se)	33.19
Zinc (Zn)	1.08
Calcium (Ca)	12.90
Antimony (Sb)	36.69
Beryllium (Be)	2.79
Boron (B)	5.78
Cobalt (Co)	2.78
Molybdenum (Mo)	14.07
Mercury (Hg)*	1.90
Vanadium (V)	1.24
Thallium (Tl)	6.45

* = EPA 7470

Table B3 - Detection Limits for VOCs in Soils (U.S. Laboratory)
By EPA Methods 8010/8020

	Detection Limit (mg/kg)		Detection Limit (mg/kg)
Benzene	0.100	Cis-1,2-Dichloroethylene	0.050
Bromodichloromethane	0.050	Trans-1,2-Dichloroethylene	0.050
Bromoform	0.100	1,2-Dichloropropane	0.050
Bromomethane	0.250	Total-1,3-Dichloropropylene	0.050
Carbon Tetrachloride	0.050	Ethylbenzene	0.100
Chlorobenzene	0.100	Methylene Chloride	0.250
Chloroethane	0.100	1,1,2,2-Tetrachloroethene	0.050
Chloroform	0.050	Tetrachloroethylene	0.050
Chloromethane	0.250	Toluene	0.100
Dibromochloromethane	0.050	1,1,1-Trichloroethane	0.050
1,2-Dichlorobenzene	0.050	1,1,2-Trichloroethane	0.050
1,3-Dichlorobenzene	0.050	Trichloroethylene	0.050
1,4-Dichlorobenzene	0.050	Trichlorofluoromethane	0.100
Dichlorodifluoromethane	0.100	Vinyl Chloride	0.100
1,1-Dichloroethane	0.050	m,p-Xylene	0.100
1,2-Dichloroethane	0.050	o-Xylene	0.100
1,1-Dichloroethylene	0.050		

Table B4 - Detection Limits for Trace Metals in Soils (U.S. Laboratory)
By EPA Method 6010 (except where noted)

	Detection Limits (mg/kg)		Detection Limits (mg/kg)
Aluminum (Al)	20	Magnesium (Mg)	500
Antimony (Sb)	5	Manganese (Mn)	5
Arsenic (As)	1	Mercury (Hg) (Method 7470)	0.04
Barium (Ba)	20	Molybdenum (Mo)	5
Beryllium (Be)	0.5	Nickel (Ni)	5
Boron (B)	20	Potassium (K)	500
Cadmium (Cd)	0.5	Selenium (Se)	0.5
Calcium (Ca)	500	Silicon (Si)	10
Chromium (Cr)	1	Silver (Ag)	2.5
Cobalt (Co)	20	Sodium (Na)	500
Copper (Cu)	5	Thallium (Tl)	1
Iron (Fe)	10	Vanadium (V)	5
Lead (Pb)	0.5	Zinc (Zn)	5

Table B5 - U.S. and Mexico Groundwater Sample Containers and Preservation

Parameters	Containers	Preservation	Laboratory Holding Times
VOCs	3-40 ml Glass Vials Teflon™-lined septum	Cool, 4 °C, HCl (pH<2) and no Headspace	14 days
Total Petroleum Hydrocarbons	2-250 ml amber bottles	Cool, 4 °C, HCl (pH<2), and no Headspace	14 days
Total & Fecal Coliform	2 plastic 100-ml containers	Cool, 4 °C, Na ₂ S ₂ O ₃	6 hours
Major Cations & Anions, Nitrates & Trace Metals	3-1 Liter Plastic Bottles	Cool, 4 °C, 0.008% HNO ₃ (pH<2) in one 1-Liter Plastic bottle (for Metals), and one 2-Liter Plastic Bottles unpreserved (for Anions, nitrates and general parameters)	28 days (Mercury) 6 months (Metals) 14 hours (Nitrates)

Table B6 - Detection Limits for VOCs in Groundwater (U.S. Laboratory)
EPA Method 502.2

	Detection Limit (ug/L)		Detection Limit (ug/L)
Benzene	0.5	1,2-Dichloropropane	0.5
Bromobenzene	0.5	1,3-Dichloropropane	0.5
Bromoform	1.0	Total-1,3-Dichloropropylene	0.5
Bromochloromethane	0.5	2,2-Dichloropropane	2.0
Bromodichloromethane	0.5	1,1-Dichloropropane	0.5
Bromomethane	5.0	Ethylbenzene	0.5
n-Butylbenzene	0.5	Hexachloro butadiene	0.5
sec-Butylbenzene	1.0	Isopropylbenzene	0.5
tert-Butylbenzene	1.0	p-Isopropyltoluene	1.0
Carbon Tetrachloride	0.5	Methylene Chloride	2.0
Chlorobenzene	0.5	Naphthalene	0.5
Chloroethane	1.0	n-propylbenzene	1.0
Chloroform	2.0	Styrene	0.5
Chloromethane	5.0	1,1,1,2-Tetrachloroethane	1.0
2-Chlorotoluene	0.5	1,1,2,2-Tetrachloroethane	0.5
4-Chlorotoluene	1.0	Tetrachloroethylene	0.5
Dibromochloromethane	1.0	Toluene	0.5
Dibromomethane	1.0	1,2,3-Trichlorobenzene	1.0
1,2-Dichlorobenzene	0.5	1,2,4-Trichlorobenzene	1.0
1,3-Dichlorobenzene	0.5	1,1,1-Trichloroethane	0.5
1,4-Dichlorobenzene	0.5	1,1,2-Trichloroethane	0.5
Dichlorodifluoromethane	1.0	Trichloroethylene	0.5
1,1-Dichloroethane	0.5	Trichlorofluoromethane	1.0
1,2-Dichloroethane	0.5	1,2,3-Trichloropropane	1.0
1,1-Dichloroethylene	0.5	1,2,4-Trimethylbenzene	1.0
Cis-1,2-Dichloroethylene	0.5	Vinyl Chloride	1.0
Trans-1,2-Dichloroethylene	0.5	Xylenes	0.5

Table B7 - Detection Limits for VOCs in Groundwater (Mexican Laboratory)
EPA Method 8240

ANALYTE	PQL ($\mu\text{g/L}$)	MDL ($\mu\text{g/L}$)
Chloromethane	0.24	0.08
Chloroethane	0.24	0.08
Vinyl Chloride	0.054	0.18
Acetone	0.09	0.03
Carbon Bisulfide	0.15	0.05
Methylene Chloride	0.31	0.1
1,1-Dichloroethane	0.405	0.13
Methyl Ethyl Ketone	0.16	0.05
Chloroform	0.092	0.03
1,1,1-Trichloroethane	0.165	0.05
1,2-Dichloroethane	0.165	0.05
Benzene	0.165	0.05
Carbon Tetrachloride	0.091	0.03
1,2-Dichloropropane	0.25	0.08
Trichloroethylene	0.165	0.05
Dichlorobromomethane	0.31	0.09
Methyl Isobutyl Ketone	0.35	0.11
Toluene	0.22	0.07
1,1,2-Trichloroethane	0.22	0.09
Chlorobenzene	0.38	0.12
Ethylbenzene	0.29	0.09
Dibromochloromethane	0.375	0.12
Tetrachloroethylene	0.165	0.05
m,p-xylenes	0.51	0.15
Bromoform	0.51	0.15
Styrene	0.51	0.15
O-xylene	0.51	0.15
1,1,2,2-Tetrachloroethane	0.22	0.07
Trichlorofluoromethane	0.51	0.15
Trichloroethane	0.165	0.05
1,2-Dichloroethane	0.31	0.10
Bromodichloromethane	0.25	0.08
1,3-Dichloropropane	0.35	0.11

PQL = Practical Quantitation Limits

MDL = Minimum Detection Limits

Table B8- Detection Limits for Major Cations & Anions in Groundwater (U.S. Laboratory)
 EPA Method 200.7 (except where noted)

	Detection Limit (ug/l)		Detection Limit (ug/l)
Calcium (Ca)	5000	Chloride (Cl) (Method 300.0)	5000
Sodium (Na)	5000	Sulfate (SO ₄) (Method 300.0)	5000
Potassium (K)	5000	Total Dissolved Solids SM2540C	1000
Magnesium (Mg)	5000	Fluoride (F) (Method 300.0)	100
Iron (Fe)	100	Nitrate (NO ₃) (Method 300.0)	100
Nitrogen as Nitrate (Method 300.0)	100	Nitrate plus Nitrite (Method 300.0)	
Total and Phenolphthalein alkalinity (CO ₃) (Method 310.11)	5000	Total Alkalinity (as CACO ₃)	2000
Carbonate	500	Bicarbonate	500

Table B9 -Detection Limits for Conventional Parameters and Coliforms in Groundwater (Mexican Laboratory)

PARAMETER	METHOD*	MINIMUM DETECTABLE (mg/L)
TOTAL HARDNESS	MA-FQ-17	2
CALCIUM HARDNESS	MA-FQ-17	2
SODIUM	FLAMOMETRIA	0.1
POTASSIUM	FLAMOMETRIA	0.1
CHLORIDE	MA-FQ-10	2
FLUORIDE	MA-FQ-19	0.02
NITRATE	MA-FQ-23	0.1
SULFATE	MA-FQ-31	5
COLIFORM	MA-MB-01 MA-MB-03	

* Manual de Metodo de Analisis. 1995. Comision Nacional del Agua. Subdireccion General Tecnica. Gerencia de Saneamiento y Calidad del Agua

Table B10 - Detection Limits for Trace Metals in Groundwater (U.S. Laboratory)
 EPA Method 200.7 (except where noted)

	Detection Limit (ug/l)		Detection Limit (ug/l)
Aluminum (Al)	200	Magnesium (Mg)	5000
Antimony (Sb) (Method 200.9)	5	Manganese (Mn)	50
Arsenic (As) (Method 200.9)	10	Mercury (Hg) (Method 245.1)	0.2
Barium (Ba)	200	Molybdenum (Mo)	50
Beryllium (Be)	5	Nickel (Ni)	50
Boron (B)	200	Potassium (K)	5000
Cadmium (Cd)	5	Selenium (Se) (Method 200.9)	5
Calcium (Ca)	5000	Silicon (Si)	100
Chromium (Cr)	10	Silver (Ag)	10
Cobalt (Co)	200	Sodium (Na)	5000
Copper (Cu)	50	Thallium (Tl) (Method 200.9)	10
Iron (Fe)	100	Vanadium (V)	50
Lead (Pb) (Method 200.9)	5	Zinc (Zn)	50

Table B11 - Detection Limits for Metals in Groundwater (Mexican Laboratory)
Method MA-AA-01*

ANALYTE	DETECTION LIMIT (mg/l)
Silver (Ag)	0.03
Aluminum (Al)	1.1
Arsenic (As)	0.0005
Barium (Ba)	0.5
Cadmium (Cd)	0.02
Chrome (Cr)	0.04
Copper (Cu)	0.04
Iron (Fe)	0.04
Potassium (K)	0.20
Magnesium(Mg)	0.20
Manganese (Mn)	0.03
Nickel (Ni)	0.05
Lead (Pb)	0.08
Selenium (Se)	0.0005
Zinc (Zn)	0.02
Calcium (Ca)	0.20
Antimony (Sb)	0.0005
Beryllium (Be)	0.03
Silica (Si)	2.1
Cobalt (Co)	0.08
Molybdenum (Mo)	0.70
Mercury (Hg)*	0.0005
Vanadium (V)	1.9
Sodium (Na)	3.0

*Manual de Metodos de Análisis. 1995. Comision Nacional del Agua Subdirección General Técnica.
Gerencia de Saneamiento y Calidad del Agua